WHAT IS CLAIMED IS:

1. An optical transmission system comprising:

a signal light source outputting signal light with a positive chirp;

an optical fiber transmission line through which the signal light propagates; and

a lumped Raman amplifier provided between said signal light source and said optical fiber transmission line, and Raman-amplifying the signal light outputted from said signal light source, said lumped Raman amplifier including a high-nonlinearity fiber having a negative chromatic dispersion at a wavelength of the signal light and a nonlinear coefficient $(2\pi/\lambda)\cdot(n_2/A_{eff})$ of 6.9 (1/W/km) or more which is defined by a nonlinear refractive index n_2 and an effective area A_{eff} at a wavelength of λ.

2. An optical transmission system according to claim 2, wherein a phase shift amount Φ_{LRA} of the signal light in said high-nonlinearity fiber is 1/2 or more of a phase shift amount Φ_T of the signal light in said optical fiber transmission line.

3. An optical transmission system according to claim 1, wherein the nonlinear coefficient $(2\pi/\lambda)\cdot(n_2/A_{eff})$ of said high-nonlinearity fiber is 12.2 (1/W/km) or more.

4. An optical transmission system according to

claim 1, wherein said high-nonlinearity fiber has a transmission loss of 0.7 dB or less at a wavelength of 1500 nm.

5. An optical transmission system according to claim 1, wherein said high-nonlinearity fiber has a transmission loss whose increase, to which OH-absorption near a wavelength of 1390 nm contributes, is 0.5 dB/km or less.

6. An optical transmission system according to claim 1, wherein said high-nonlinearity fiber has a chromatic dispersion of -20 ps/nm/km or less at the wavelength of the signal light.

7. An optical transmission system according to claim 1, wherein the signal light includes a plurality of signal channels having a wavelength spacing of 10 nm or more, and said high-nonlinearity fiber ha a chromatic dispersion of -10 ps/nm/km or less at the wavelength of the signal light.